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twelve chapters on the following subjects: protoplasm, the plant cell, the cell wall, the formation of new cells, the products of the cell, the tissues, the tissue systems, intercellular spaces and secretion reservoirs, the plant body, the chemical constituents of plants, the chemical processes in the plant, and twelfth and lastly, the relations of plants to external agents. We have read most of this part with much interest, and do not know of a briefer, clearer and better illustrated exposition of the subjects treated. It is well adapted to give one who has but little special knowledge of botany a clear conception of the plant as an organism. A good many technical names are used, and an elementary knowledge of botany is required of the student, so that while we doubt whether high school classes are sufficiently advanced to use the book, the teachers of such classes should master this portion and present it in as simple language as possible to their pupils.

The second part occupies the last four hundred pages of the book, and is entitled, *Special Anatomy and Physiology*. It treats of the general classification of plants. The arrangement of the lower plants is a modification of the system of Sachs, while the author has made a considerable innovation in raising the Proto-phyta, Zygosporæ, Oösporæ and Carposporæ to the dignity of primary divisions of the vegetable kingdoms, of the same rank as the Bryophyta, Pteridophyta and Phanerogamia. This part contains brief general descriptions of the cohorts, orders and tribes of plants, with sufficient reference to economic botany.

The illustrations are excellent and abundant, there being five hundred and seventy-three cuts scattered through the volume, a large number taken from Sachs' Botany, from De Bary, Hofmeister and other German, French and English works, while a number are original, having been drawn by Mr. J. C. Arthur.

The work bears evidence of care and accuracy in its preparation, and while we have borne testimony to the general plan and its treatment, we leave to others the task of detecting and noticing the errors and shortcomings, if such occur.

HUXLEY'S INTRODUCTORY TO SCIENCE PRIMERS.<sup>1</sup>—Every incipient biologist or geologist should study this little primer, which will serve admirably its purpose as a brief and plain introduction to the study of nature. It is well calculated to be used as a text book for classes in elementary biology or geology, and we intend to use it as a basis for preliminary instruction to a course of physical geography. Beginning with nature and science it treats of sensation and things, causes and effects, the order of nature, laws of nature, and gives a definition of science. A second part discusses material objects, which are divided (A) into mineral bodies,

<sup>1</sup> *Science Primers*. Edited by Profs. HUXLEY, ROSCOE and BALFOUR STEWART. Introductory. By Prof. HUXLEY, F.R.S. New York, D. Appleton & Co., 1880. 18mo, pp. 94. 35 cents.

water being the mineral chiefly referred to for the sake of illustration, and (B) living bodies. Under the latter head the wheat plant and the substances of which it is composed, the common fowl and the substances of which it is composed, are described in the compass of three pages; then the constituents of the body common to the wheat plant and the fowl. What is meant by the word living, and how the living plant comports itself, and how the living animal grows, and how living bodies differ from mineral bodies is told in a few clear, simple sentences. Finally the science of biology and its subdivisions, botany and zoology, are defined, and a final page or two is devoted to mental phenomena and the definition of psychology.

EMERTON'S SEASIDE COLLECTING.<sup>1</sup>—In England and France popular works on the animals of the seashore, and the names of Gosse, Forbes, Kingsley and Quatrefages are associated with some of the most entertaining books that have ever been written. America, on the other hand, has been woefully deficient in works of this character. The only ones which approach it being Mrs. Agassiz's *Seaside Studies*, Verrill and Smith's *Invertebrata of Vineyard sound*, and the charming little work of "Actæa." In the present volume Mr. Emerton has given us a well illustrated account of the common marine forms of invertebrates with the methods of collecting them. The work is written in Mr. Emerton's straightforward manner, and from a literary point of view is superior to his well-known volume on spiders. A fair proportion of the 161 figures which illustrate the book are new, while the remainder have not been copied often enough to render them at all hackneyed. The pictures of *Lophothuria fabricii* and *Pentacta frondosa* are possibly the best. Here we would remark that the genera *Callinectes*, *Lophothuria* and *Leptosynapta* seem founded on decidedly insufficient grounds, and should be replaced by *Neptunus*, *Peolus* and *Synapta*. The book is well printed on good paper and forms a very handy volume for all seaside visitors, and would prove especially valuable to the many who throng our watering places and who wish to know something of marine life.

It might not come amiss to add here that this is the first volume published by Mr. Bates, the successor to Mr. Cassino in the Naturalist's Bureau at Salem, Mass., and that it reflects great credit on the publisher.—J. S. K.

ZITTEL'S PALÆONTOLOGY.<sup>2</sup>—The third part of Vol. I of this important work especially commends itself to American palæontologists, since it continues and completes the elaborate account of

<sup>1</sup> *Life on the Seashore, or Animals of our Coasts and Bays.* By JAMES H. EMERTON. 8vo, pp. xx and 143. Salem, George A. Bates, 1880.

<sup>2</sup> *Handbuch der Palæontology.* Unter mitwirkung von W. PH. SCHIMPER. Herausgegeben von Karl A. Zittel. 1 Band, III Lieferung, mit 195 original holzschnitten, München, 1879, 8vo.